

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference F175522	FOR FURTHER ACTION		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2004/002543	International filing date (day/month/year) 30/01/2004	(Earliest) Priority Date (day/month/year) 30/01/2003	
Applicant UNIVERSITY OF MARYLAND, BALTIMORE			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the drawings,

a. the figure of the **drawings** to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☒ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US2004/002543

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07G17/00 C07H19/00 C07H19/16		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 C07G C07H Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, CHEM ABS Data, WPI Data, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	HOSSEINI M W ET AL: "MULTIPLE MOLECULAR RECOGNITION AND CATALYSIS. A MULTIFUNCTIONAL ANION RECEPTOR BEARING AN ANION BINDING SITE, AN INTERCALATING GROUP, AND A CATALYTIC SITE FOR NUCLEOTIDE BINDING AND HYDROLYSIS" 1990, JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, DC, US, PAGE(S) 3896-3904 , XP000891840 ISSN: 0002-7863 figures 9,10 ----- -/--	11
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the international search 29 June 2004		Date of mailing of the international search report 23/08/2004
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Klein, D

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LOMOZIK, LECHOSLAW ET AL: "Copper(II) ions as a factor interfering in the interaction between bioligands in systems with adenosine and polyamines" 1996, JOURNAL OF INORGANIC BIOCHEMISTRY , 63(3), 191-206 CODEN: JIBIDJ; ISSN: 0162-0134 , XP002286291 -----	11
A	FENNIRI, HICHAM ET AL: "Molecular recognition of NADP(H) and ATP by macrocyclic polyamines bearing acridine groups" HELVETICA CHIMICA ACTA , 80(3), 786-803 CODEN: HCACAV; ISSN: 0018-019X, 1997, XP001189678 -----	11
A	POL'SHAKOV, V. I. ET AL: "Interaction of the antitumor drugs prospidin and spirobromin with nucleotides" KHIMIKO-FARMATSEVTICHESKII ZHURNAL , 21(5), 528-36 CODEN: KHFZAN; ISSN: 0023-1134, 1987, XP009032761 -----	11
A	POL'SHAKOV, V. I. ET AL: "Interaction of spirazidine, prospidine, and spirobromine with nucleic acid components" KHIMIKO-FARMATSEVTICHESKII ZHURNAL , 23(1), 10-16 CODEN: KHFZAN; ISSN: 0023-1134, 1989, XP009032762 -----	11

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-10,12-23

Present claims 1-10, 12-23 relate to a compounds defined by reference to a desirable characteristic or property, namely compounds "that bind to the hemoglobin binding site on cytochrome b5 and competitively inhibits hemoglobin binding to cytochrome b5"

The claims cover all compounds having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT for only a very limited number of such compounds. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the compounds by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the compounds having the following simultaneous characteristics :

Compounds wherein

- 1) R1 is defined as in claims 2-4 (a linear or cyclic polyamine or hexacyclene), and
- 2) R2 is a moiety that links R1 and R3 (whatever this moiety may represent) and
- 2) R3 is defined as in claims 7-9 (ATP or ATP analogues).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.